

THAT WHICH IS CLAIMED Is:

1. An apparatus for stabilizing movement of the patella in the patellofemoral joint, while permitting flexion of the knee during physical activities, said apparatus comprising:

a patterned flexible base sheet member defining at least one opening;

a padded buttress having one portion fixed against one side of said opening and having at least another portion removably attachable to an opposite side of said opening; and

a flexible tensioning sheet overlying said padded buttress, said tensioning sheet having one portion fixed to said base sheet member adjacent said opening and having at least another portion removably attachable to said base sheet member at an opposite side of said opening.

2. An apparatus according to Claim 1, wherein said flexible base sheet member has a top planar side and a bottom planar side, said top planar side having fasteners for removably attaching at least a portion of said flexible base sheet member, said padded buttress, and said flexible tensioning sheet to at least a portion of said top planar side of said base sheet member.

3. An apparatus according to Claim 1, wherein portions of said flexible base sheet member are foldable against and removably fixed to one another to thereby define a sleeve.

4. An apparatus according to Claim 1, wherein said flexible base sheet member is formed from an elastomeric material.

5. An apparatus according to Claim 1, wherein said flexible tensioning sheet is formed from an elastomeric material.

6. An apparatus according to Claim 1, wherein said padded buttress is substantially arcuate and concave with respect to said opening.

7. An apparatus according to Claim 1, further comprising:

at least one tensioning arm secured to the portion of said padded buttress that is removably attachable to a side of said opening; and

at least one tensioning arm secured to the portion of said flexible tensioning sheet that is removably attachable to said flexible base sheet member.

8. An apparatus according to Claim 7, wherein said padded buttress tensioning arm and said flexible tensioning sheet tensioning arm have fasteners for removably attaching at least a portion of said padded buttress and said tensioning sheet to said flexible base sheet member.

9. An apparatus according to Claim 1, further comprising a stabilizing member having one end fixed to said flexible base sheet member adjacent said flexible tensioning sheet and having the other end free.

10. A support brace for stabilizing a joint, said brace comprising:

a base defining an opening for receiving portions of a joint when said base is extended against the joint;

a buttress covering at least a portion of said opening, said buttress secured to said base adjacent said opening and proximate the joint for applying a first force against those sections of the joint in said opening; and

a tensioning member covering said buttress and portions of said opening, said tensioning member secured to said base adjacent said buttress and proximate the joint for applying a second force against the joint in addition to the first force applied by said buttress.

11. A support brace according to Claim 10, wherein said base has an internal planar side and an external planar side, said external planar side having fasteners for removably attaching at least a portion of said base, said buttress, and said tensioning member to at least a portion of said external planar side of said base.

12. A support brace according to Claim 10, wherein portions of said base are foldable against and removably fixed to one another to define a sleeve that wraps around the joint.

13. A support brace according to Claim 10, wherein said buttress is arcuate and positioned concave with respect to the joint.

14. A support brace according to Claim 10, wherein:

at least a portion of said buttress is removably attachable to a portion of said base opposite the portion to which said buttress is secured; and

at least a portion of said tensioning member is removably attachable to a portion of said base opposite the portion to which said tensioning member is secured.

15. A support brace according to Claim 14, wherein said buttress and said tensioning member removably attach to said base using hook and loop fasteners.

16. A support brace according to Claim 10, wherein the first force applied by said buttress and the second force applied by said tensioning member are co-directional and cumulative.

17. A support brace according to Claim 10, wherein the first force applied by said buttress and the second force applied by said tensioning member are medial forces.

18. A support brace according to Claim 10, wherein the first force applied by said buttress and the second force applied by said tensioning member are lateral forces.

19. A support brace according to Claim 10, wherein said joint is a knee, and said buttress and said tensioning member stabilize patellar movement.

20. A support brace according to Claim 10, wherein said base and said tensioning member are formed from an elastomeric material.

21. A support brace according to Claim 10, further comprising:

at least one tensioning arm secured to a portion of said buttress opposite the portion secured to said base, said buttress tensioning arm removably attachable to said base for selectively applying the first force; and

at least one tensioning arm secured to a portion of said tensioning member opposite the portion secured to said base, said tensioning member tensioning arm removably attachable to said base for selectively applying the second force.

22. A support brace according to Claim 10, further comprising a stabilizing member having one end fixed to said base adjacent said tensioning member and having another end free for preventing movement of said base and said buttress relative to the joint when said buttress and said tensioning member are extended across portions of said opening.

23. A support brace according to Claim 10, wherein said base includes at least one elongate compression member that extends laterally from the portion of said base to which said tensioning member is secured.

24. A support brace for stabilizing movement of the patella in the patellofemoral joint, while permitting flexion of the knee during physical activities, said brace comprising:

an elastomeric base defining an opening for receiving at least a portion of the patella when said base is extended against the knee, said base having a pair of spaced apart elongated compression members;

a substantially arcuate buttress covering at least a portion of said opening, said buttress secured to said base adjacent said opening and proximate the patella for applying a first force against the patella;

a pair of tensioning arms secured to end portions of said buttress opposite the portion of said buttress secured to said base, said pair of buttress tensioning arms removably attachable to said base for selectively applying the first force;

an elastomeric tensioning member covering said buttress and portions of said opening, said tensioning member secured to said base adjacent said buttress and proximate the patella for applying a second force against the patella in addition to the first force applied by said buttress;

a pair of tensioning arms secured to portions of said tensioning member opposite the portion of said first tensioning member secured to said base, said pair of tensioning member tensioning arms removably attachable to said base for selectively applying the second force; and

a stabilizing member having one end fixed to an edge of said base adjacent said tensioning member and having another end free for preventing movement of said base and said buttress relative to the patella when said buttress and said tensioning member are extended across portions of said opening.

25. An apparatus according to Claim 24, wherein said base has an internal planar side and an external planar side, said external planar side having fasteners for removably attaching said pair of buttress tensioning arms, said pair of tensioning member tensioning arms, and said pair of compression members to at least a portion of said external planar side of said base.

26. An apparatus according to Claim 25, wherein said base includes a tissue contact patch positioned on said internal planar side adjacent said opening.

27. An apparatus according to Claim 25, wherein said pair of buttress tensioning arms, said pair of tensioning member tensioning arms, and said pair of compression members removably attach to said base using hook and loop fasteners.

28. An apparatus according to Claim 24, wherein portions of said base are foldable against and removably fixed to one another to thereby define a sleeve.

29. An apparatus according to Claim 24, wherein said pair of compression members are of sufficient length to extend around the knee and removably attach to said base for selectively applying a compressive force against the knee.

30. An apparatus according to Claim 24, wherein said pair of buttress tensioning arms facilitate the application of force vectors against the knee in selectable angular orientations.

31. An apparatus according to Claim 24, wherein said pair of buttress tensioning arms extend in directions substantially divergent from one another relative to said buttress when removably attached to said base to thereby increase the amount of the first force applied against the patella during flexion of the knee.

32. An apparatus according to Claim 24, further comprising a first and second elongated rib secured to said base on opposite sides of said opening, said first and second ribs substantially parallel to one another.

33. An apparatus according to Claim 32, wherein said first and second ribs extend from an upper portion of said base to a lower portion of said base.

34. An apparatus according to Claim 32, wherein:

    said first rib is secured to said base adjacent said tensioning member such that said first rib is positioned between said opening and said stabilizing member; and

    said second rib is secured to said base adjacent said opening such that said second rib is positioned between said opening and an edge of said base that is opposite the edge to which said stabilizing member is fixed.

35. An apparatus according to Claim 24, wherein said stabilizing member is a looped tab.

36. An apparatus according to Claim 24, wherein said buttress has a tissue contact surface formed from material that restricts movement of said buttress relative to the tissue when said buttress is extended across said opening and removably attached to said base.

37. A method for stabilizing movement of the patella in the patellofemoral joint, while permitting flexion of a knee during physical activities, the method comprising the steps of:

    positioning a support brace having at least one opening for receiving portions of a knee against the knee;

extending a portion of the brace against the knee to apply a first force against portions of the knee in the opening; and

extending another portion of the brace against the knee to apply a second force against the knee.

38. A method according to Claim 37, further comprising securing the brace to prevent movement of the brace and buttress relative to the knee when the first and second forces are applied against the knee, the step of securing performed after the step of positioning the brace and before the step of extending a portion of the brace against the knee to apply a first force.

39. A method according to Claim 37, wherein the step of positioning comprises:

wrapping the brace around the knee such that the opening receives the patella; and

removably fixing portions of the brace to one another to form a sleeve around the knee for applying a compressive force against portions of the knee surrounded by the brace.

40. A method according to Claim 39, wherein the step of removably fixing comprises applying the compressive force about the superior and inferior portions of the knee.

41. A method according to Claim 37, wherein the first step of extending comprises selectively applying the first force against the knee to adjust the desired tension on the knee.

42. A method according to Claim 37, wherein the first step of extending further comprises:

extending a buttress having one portion secured to the brace across at least a portion of the opening; and

removably attaching another portion of the buttress to the brace such that the buttress covers at least a portion of the knee in the opening.

43. A method according to Claim 42, wherein the step of extending the buttress comprises extending the buttress against a portion of the patella.

44. A method according to Claim 37, wherein the second step of extending comprises selectively applying the second force against the knee to adjust the desired tension on the knee.

45. A method according to Claim 37, wherein the second step of extending further comprises:

extending a flexible sheet having one portion secured to the brace across at least a portion of the opening; and

removably attaching another portion of the flexible sheet to the brace such that the sheet overlies the buttress and at least a portion of the opening.

46. A method according to Claim 45, wherein the step of extending the flexible sheet comprises extending the sheet against a portion of the patella.

47. A method according to Claim 37, wherein the first and second steps of extending comprise applying first and second forces, respectively, that are co-directional and cumulative.

48. A method according to Claim 37, wherein the first and second steps of extending comprise applying first and second forces, respectively, that are lateral with respect to the knee.

49. A method according to Claim 37, wherein the first and second steps of extending comprise applying first and second forces, respectively, that are medial with respect to the knee.